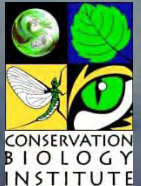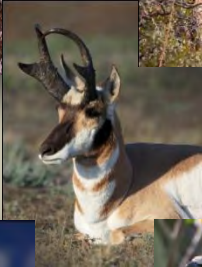# Mapping Landscape Intactness for BLM Rapid Ecoregional Assessments

James R. Strittholt, Ph.D.
Tim Sheehan
Brendan Ward

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Corvallis, Oregon
www.consbio.org

Conservation Elements
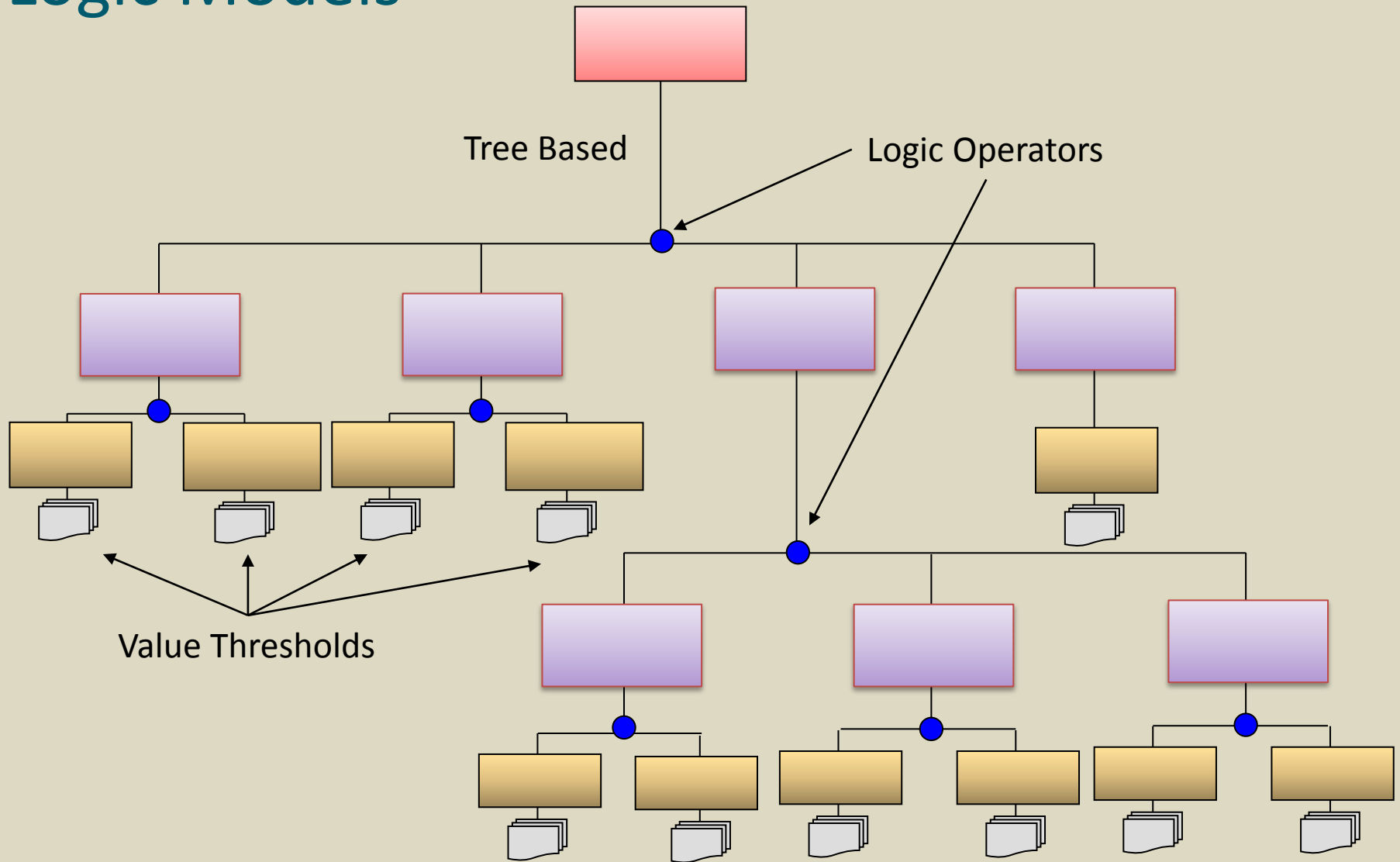
Change Agents

Development

Invasives

Fire

Energy

CLIMATE CHANGE

Logic Models



Tree Based

Logic Operators

Value Thresholds

Multiple factors combined to address a question

Based on Fuzzy Logic

Provides a way of normalizing different types of data into a common range of values ("fuzzy values").

e.g. High Intactness might take into account:
- Oil wells (point density)
- Roads (linear density)
- Invasive species extent (percent area)

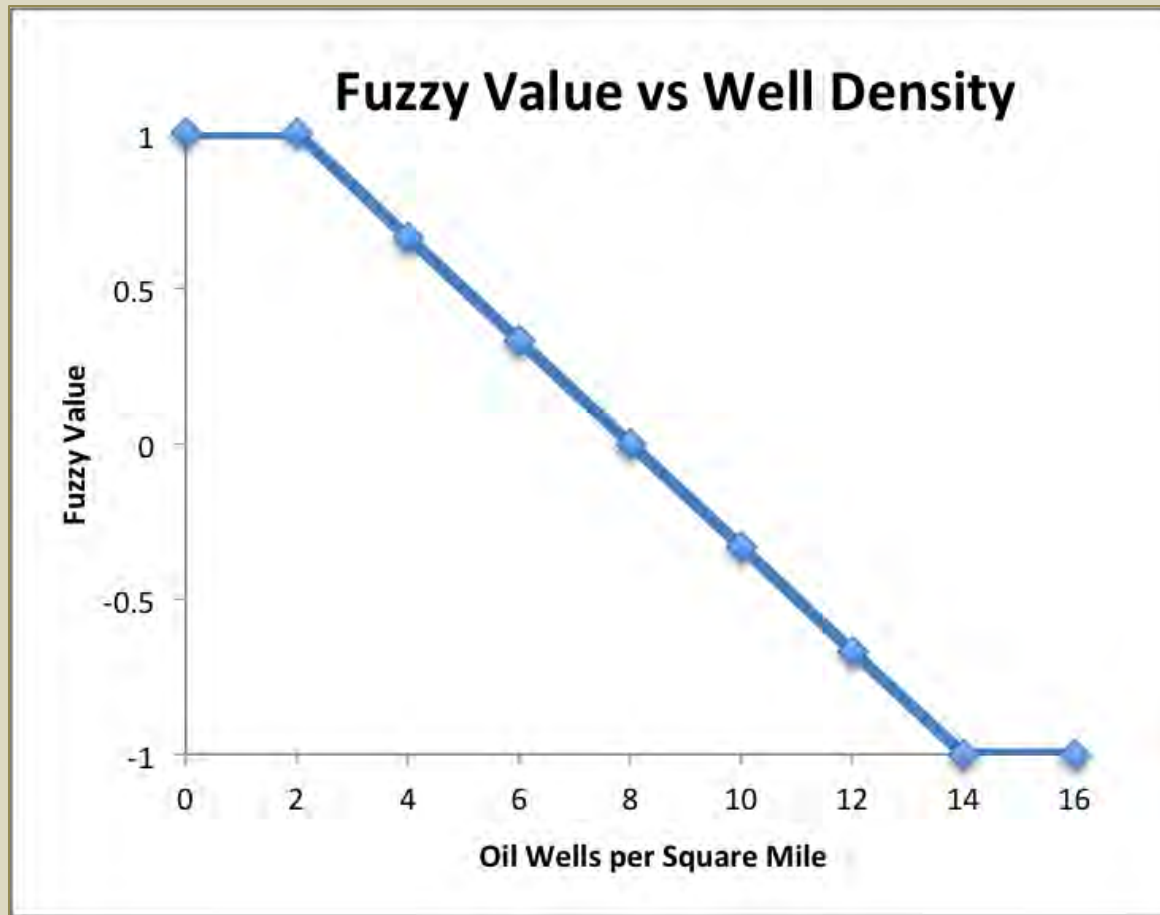| -1.000	**Shades of falseness**	0.000	**Shades of trueness**	+1.000
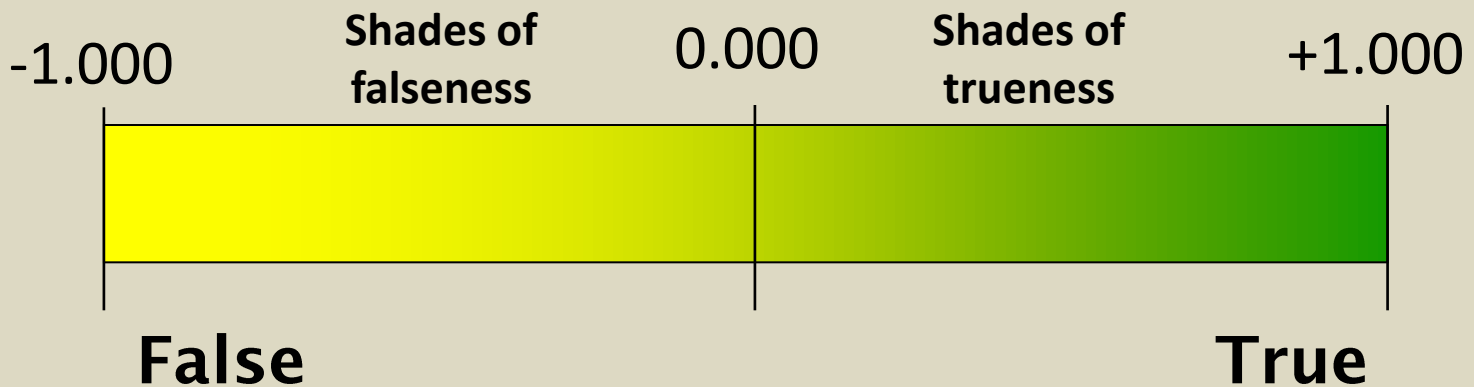
False   **True**

Example: Low Oil Well Density

Proposition: Mapped polygon has low oil well density

TRUE threshold: 2 oil wells per mi^2
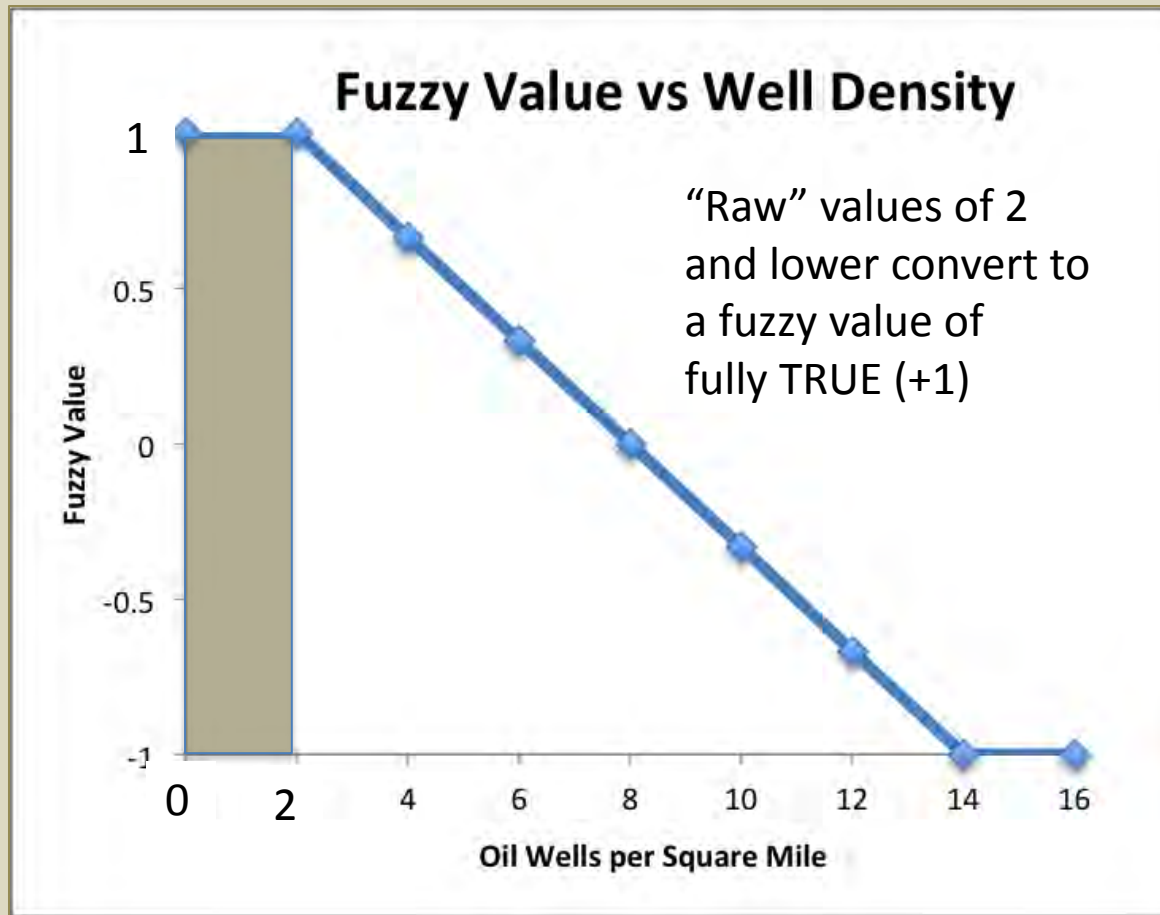
FALSE threshold: 14 oil wells per mi^2

Low Oil Well Density
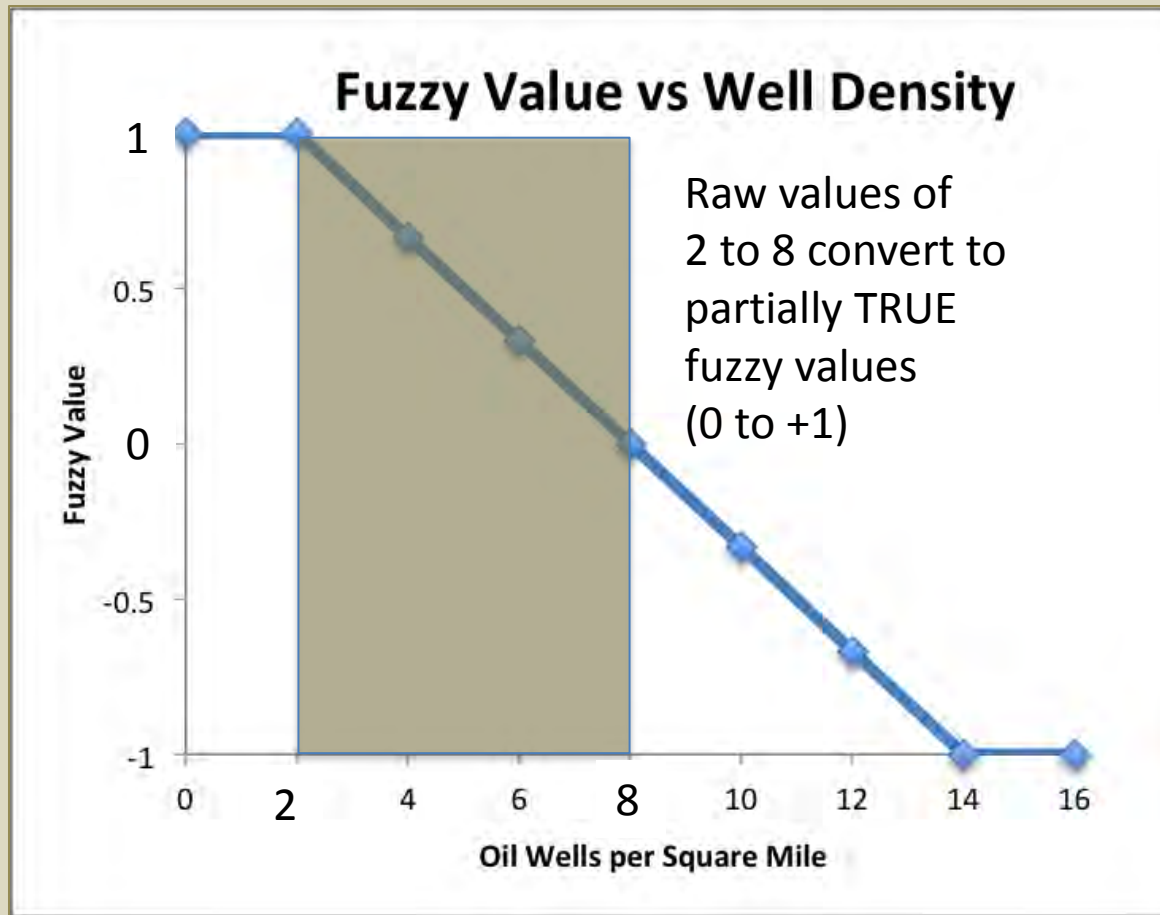## Real value to fuzzy value conversion

Low Oil Well Density
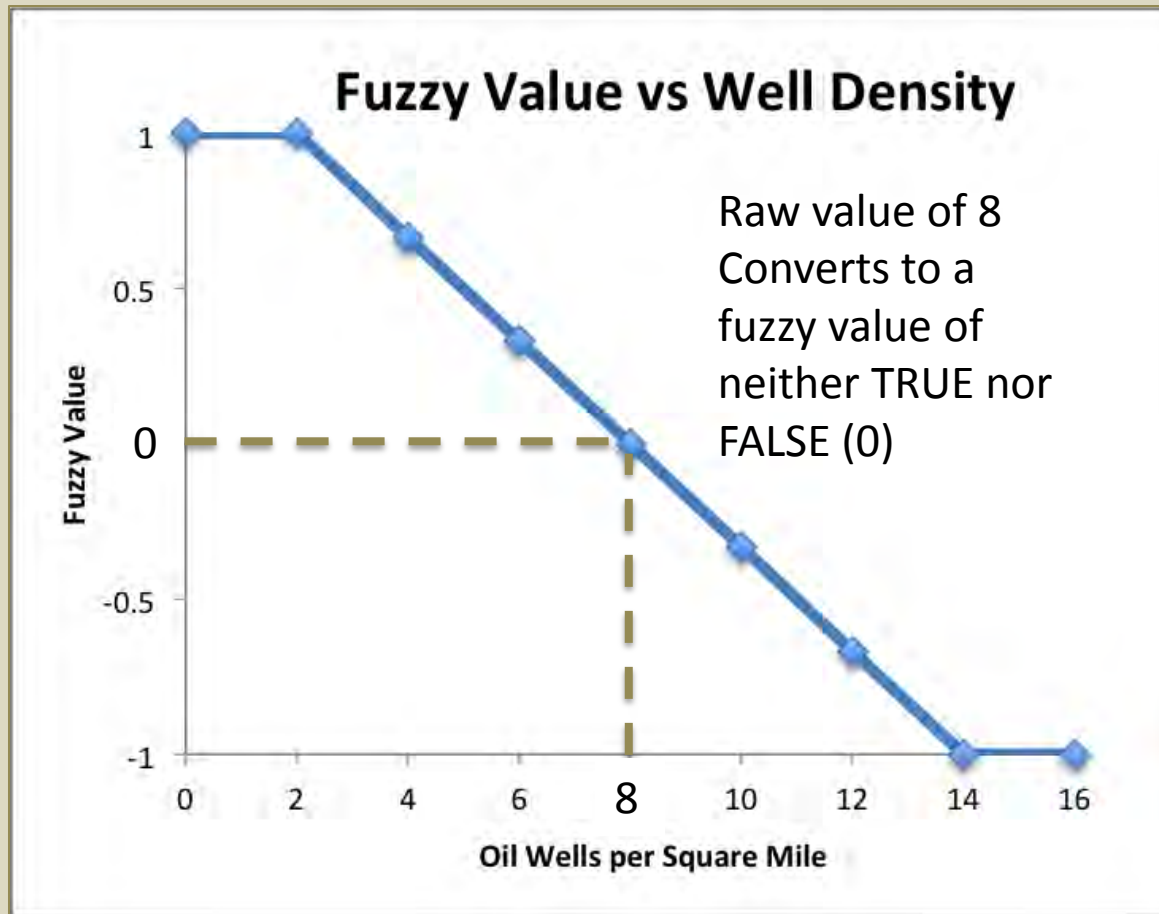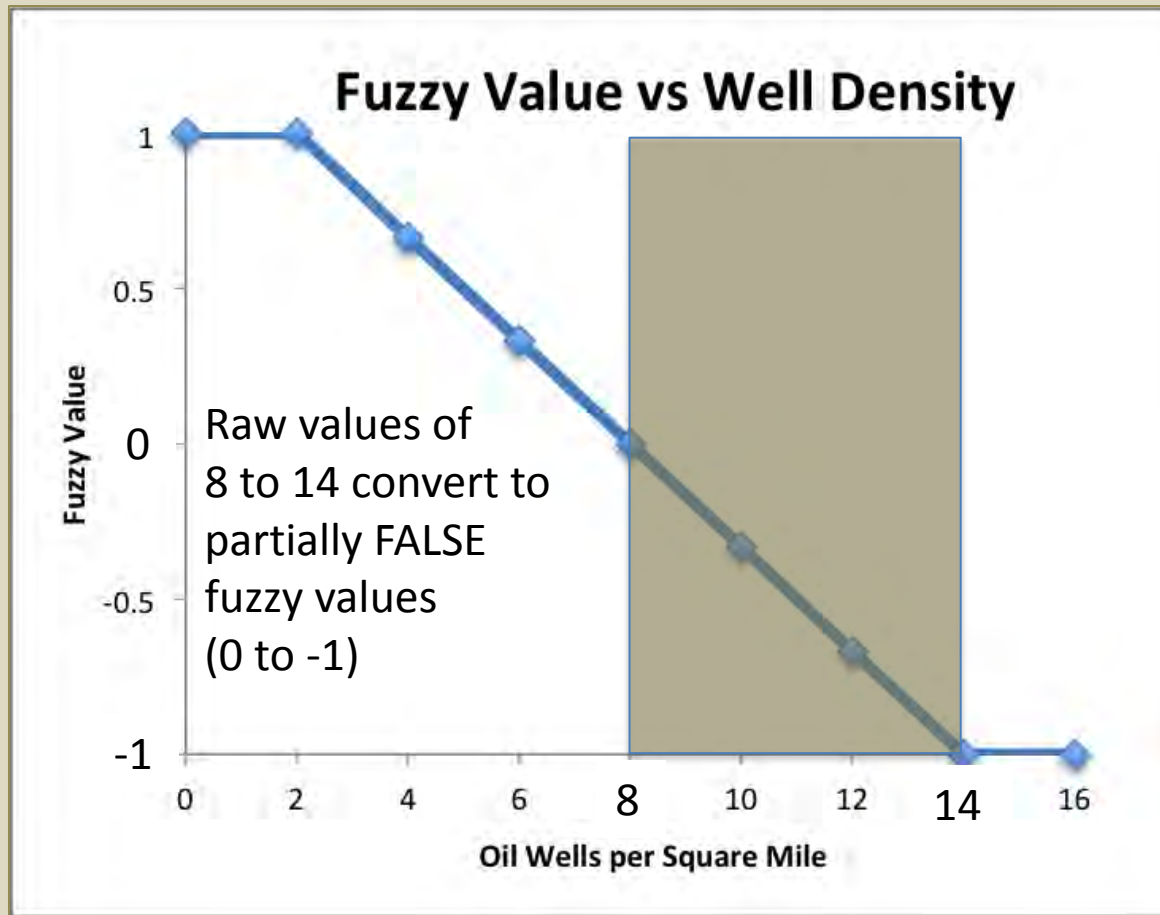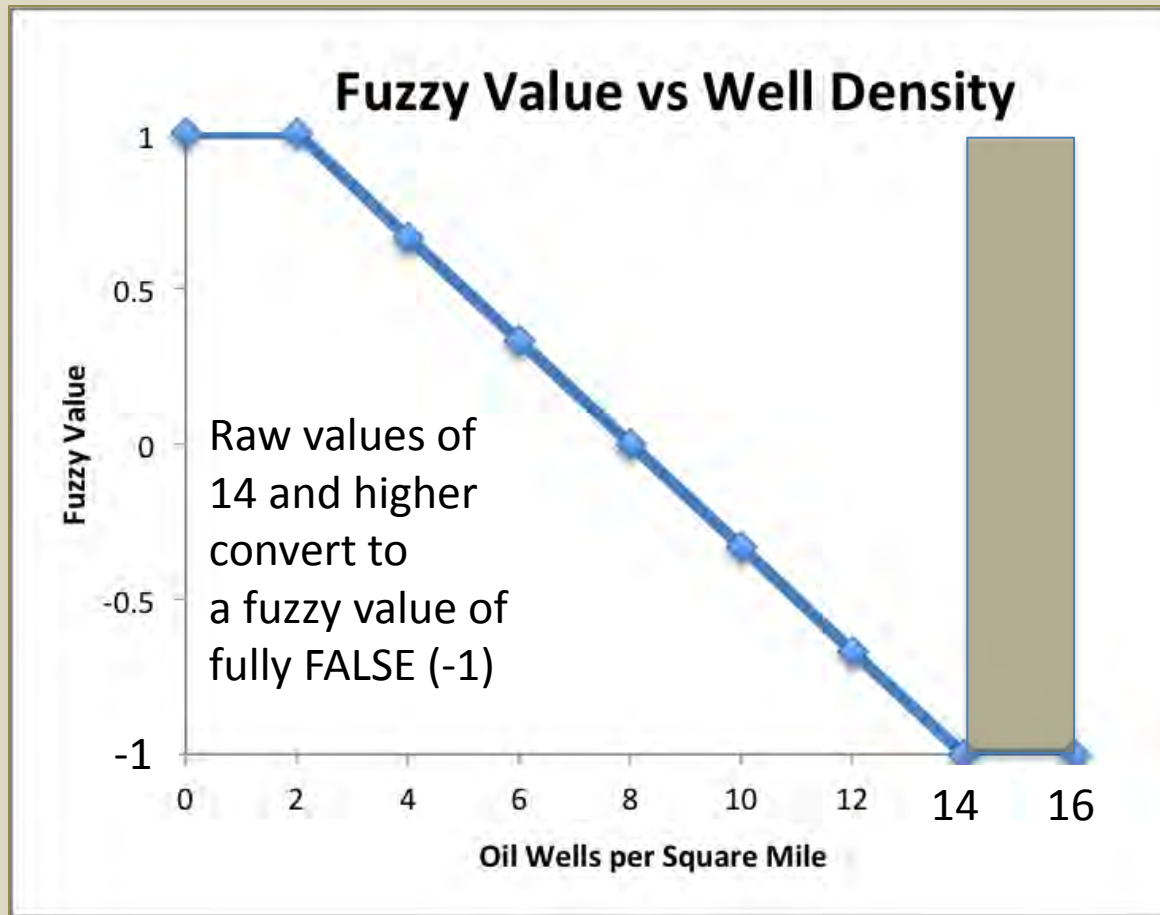## Real value to fuzzy value conversion


Fuzzy Value vs Well Density

"Raw" values of 2 and lower convert to a fuzzy value of fully TRUE (+1)

Low Oil Well Density
Real value to fuzzy value conversion

Fuzzy Value vs Well Density

Raw values of
2 to 8 convert to
partially TRUE
fuzzy values
(0 to +1)

Oil Wells per Square Mile

Low Oil Well Density
Real value to fuzzy value conversion

Fuzzy Value vs Well Density

Raw value of 8
Converts to a
fuzzy value of
neither TRUE nor
FALSE (0)

Fuzzy Value

Oil Wells per Square Mile

Low Oil Well Density
Real value to fuzzy value conversion

Low Oil Well Density
Real value to fuzzy value conversion

Fuzzy Value vs Well Density

Raw values of
14 and higher
convert to
a fuzzy value of
fully FALSE (-1)

Oil Wells per Square Mile

Current Terrestrial Landscape Intactness
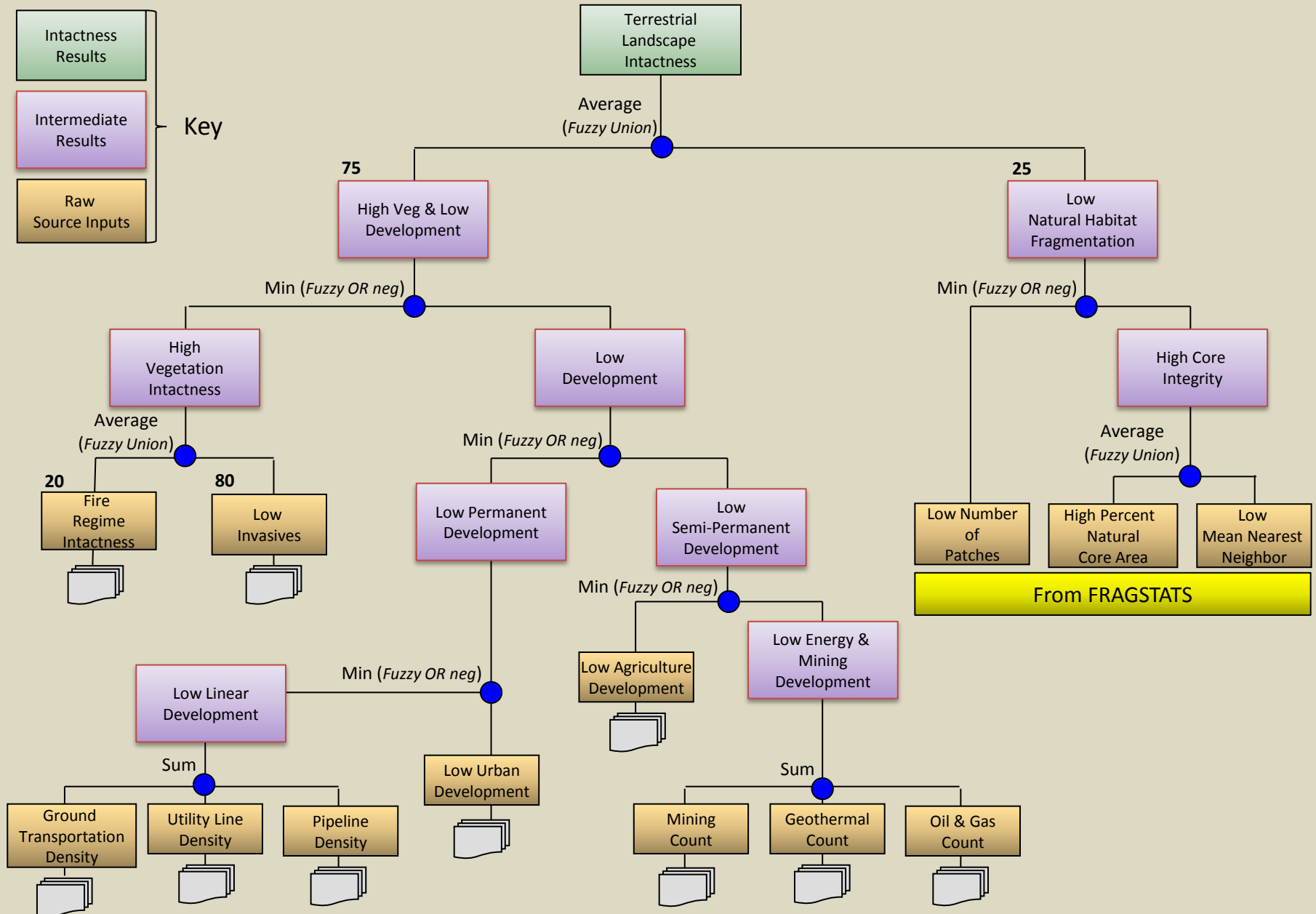
Current Terrestrial Landscape Intactness
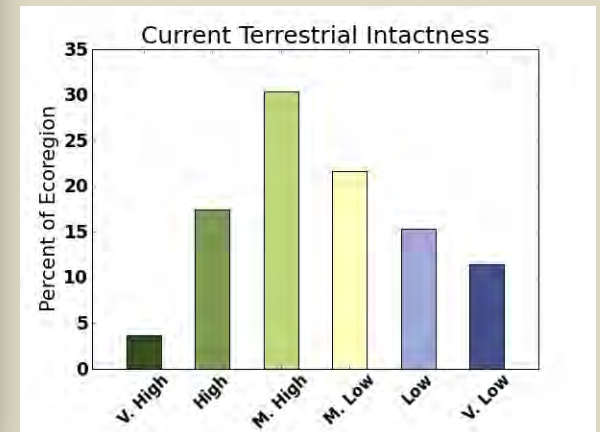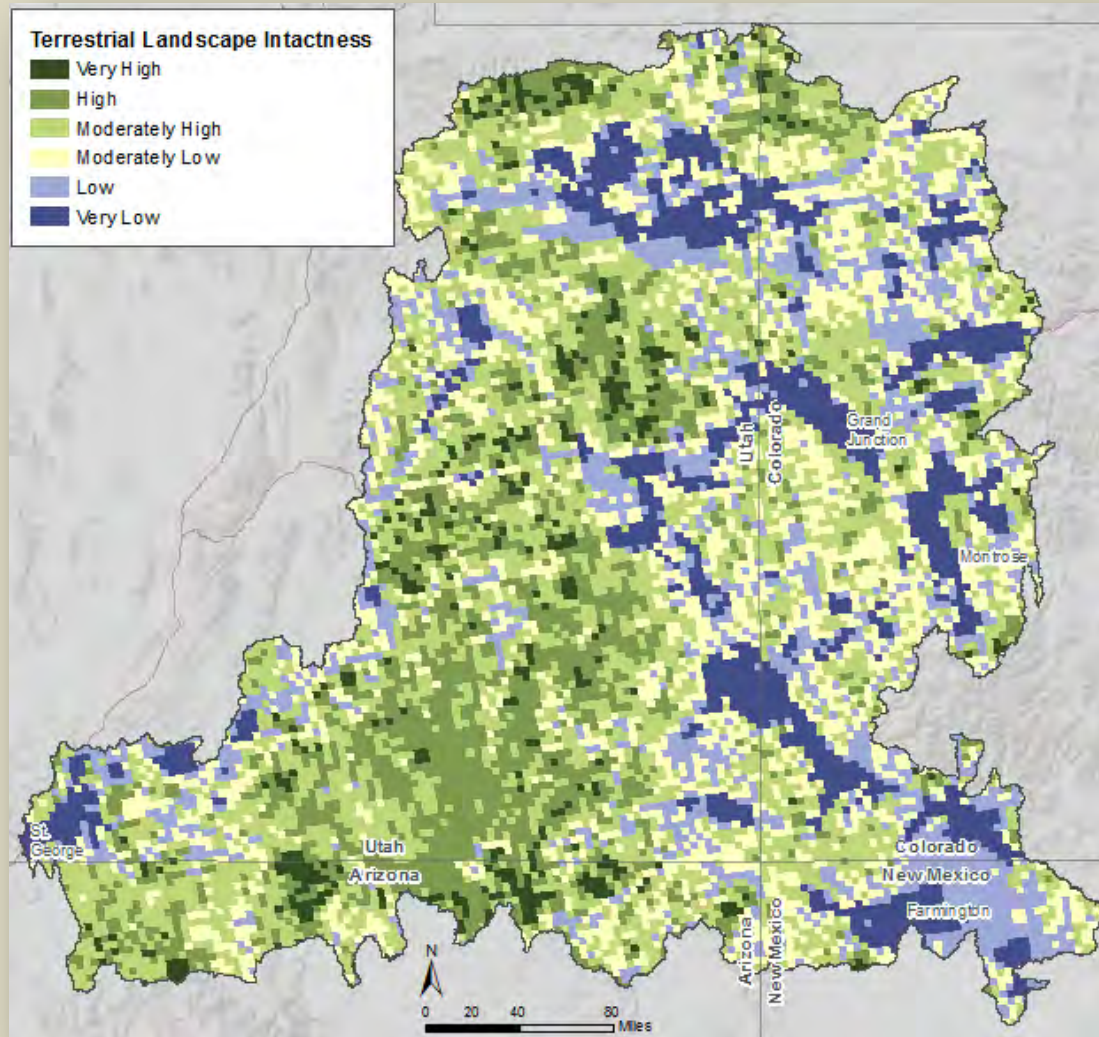
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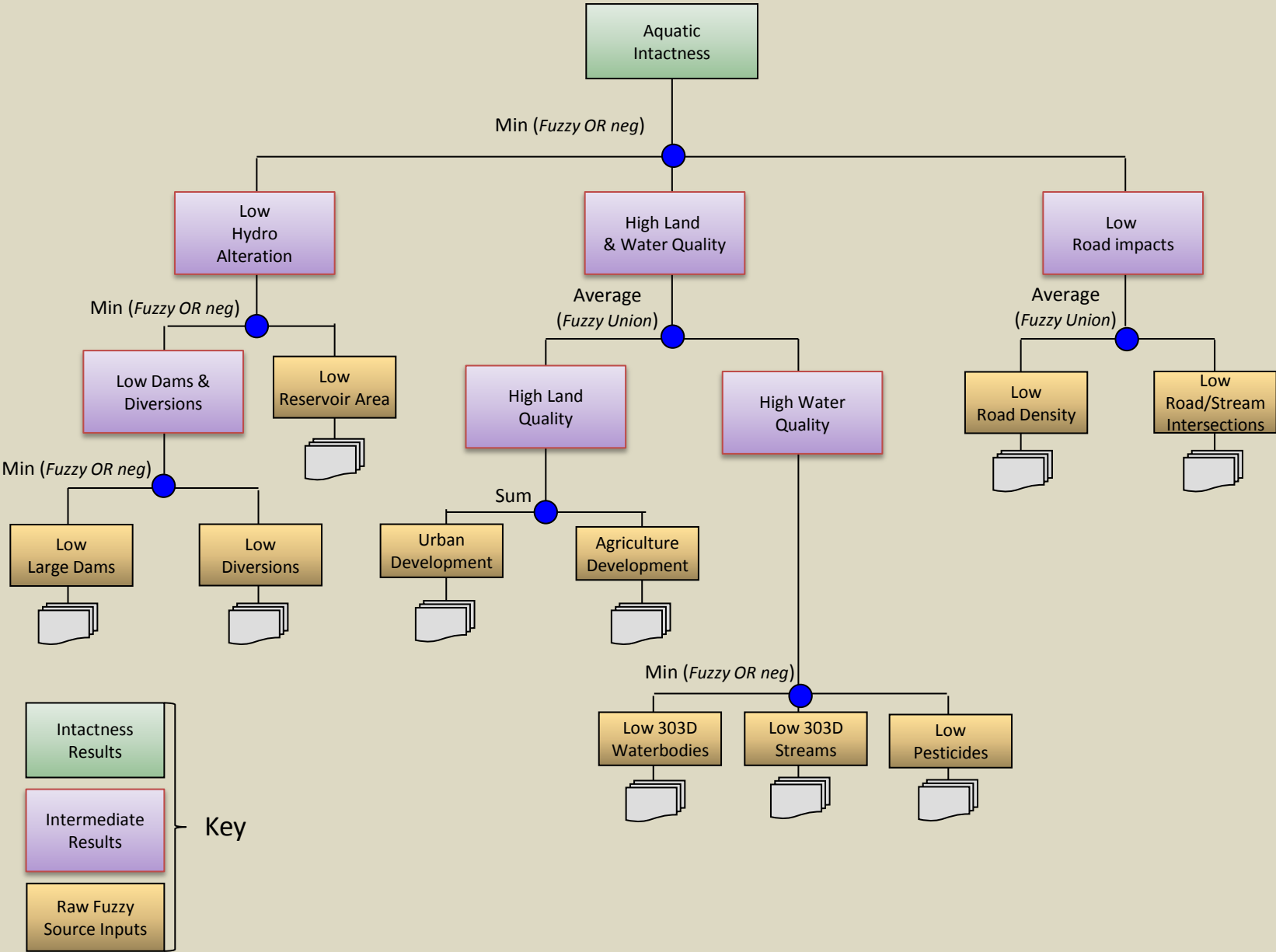
Current Aquatic Intactness
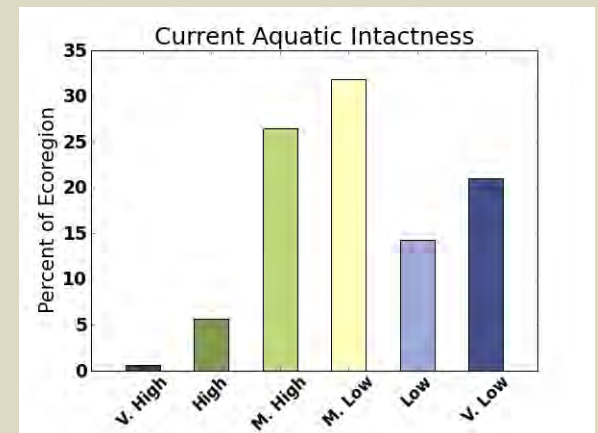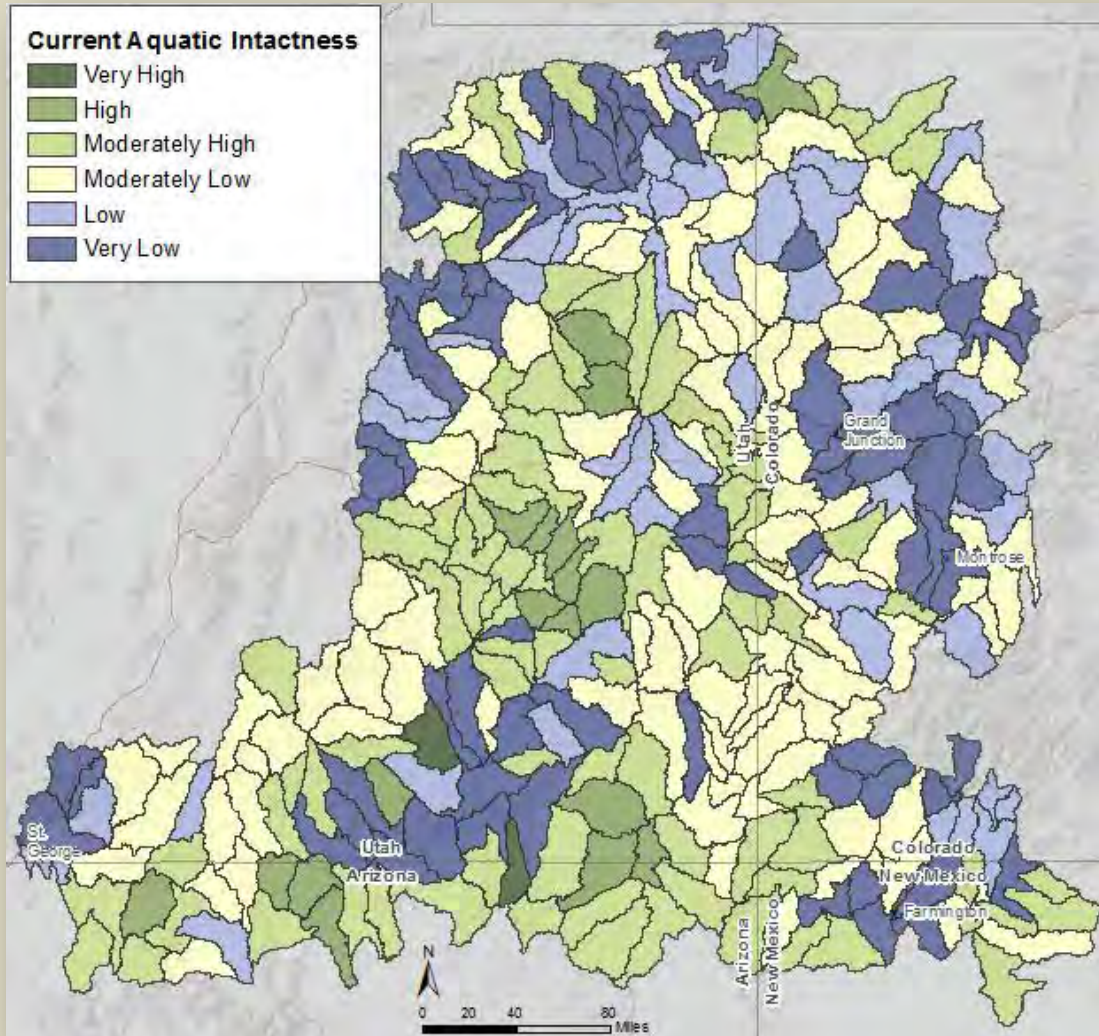
Greater and Gunnison Sage Grouse
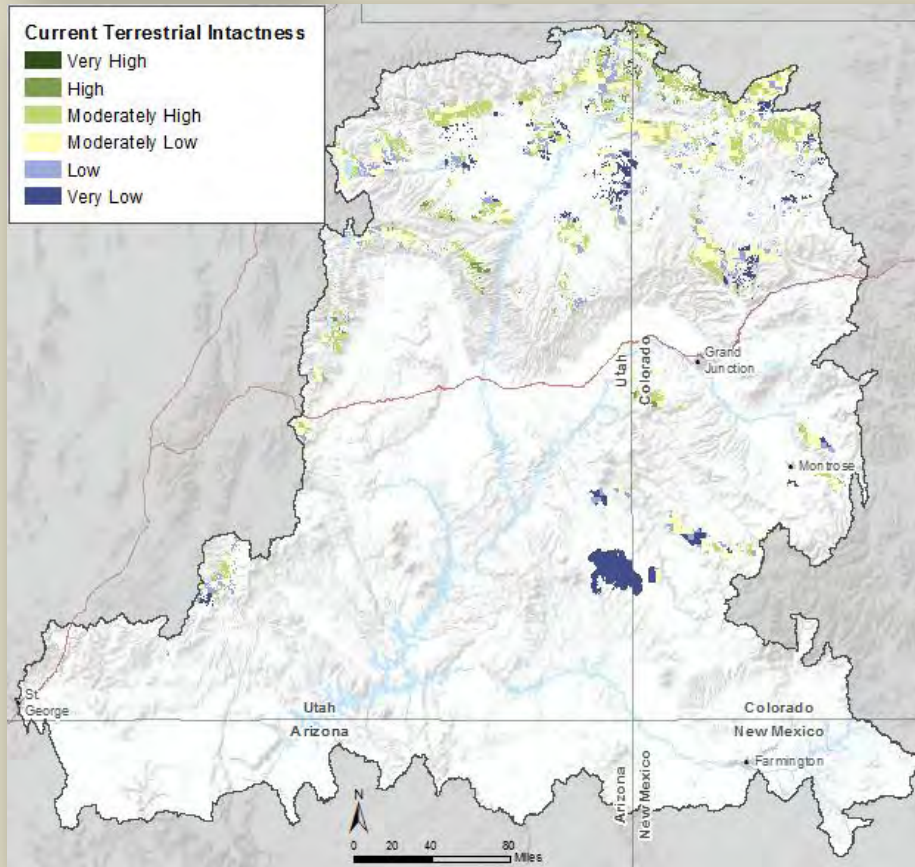
Greater Sage Grouse
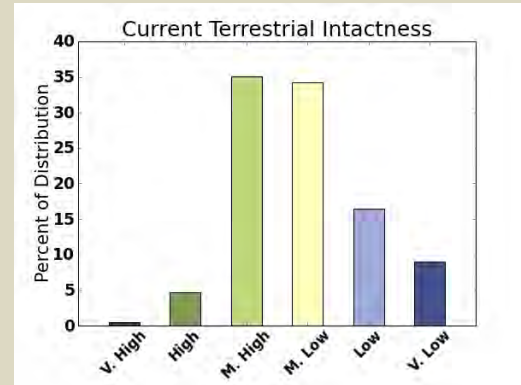
Gunnison Sage Grouse
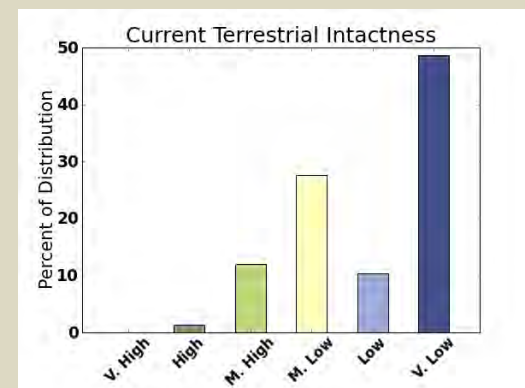
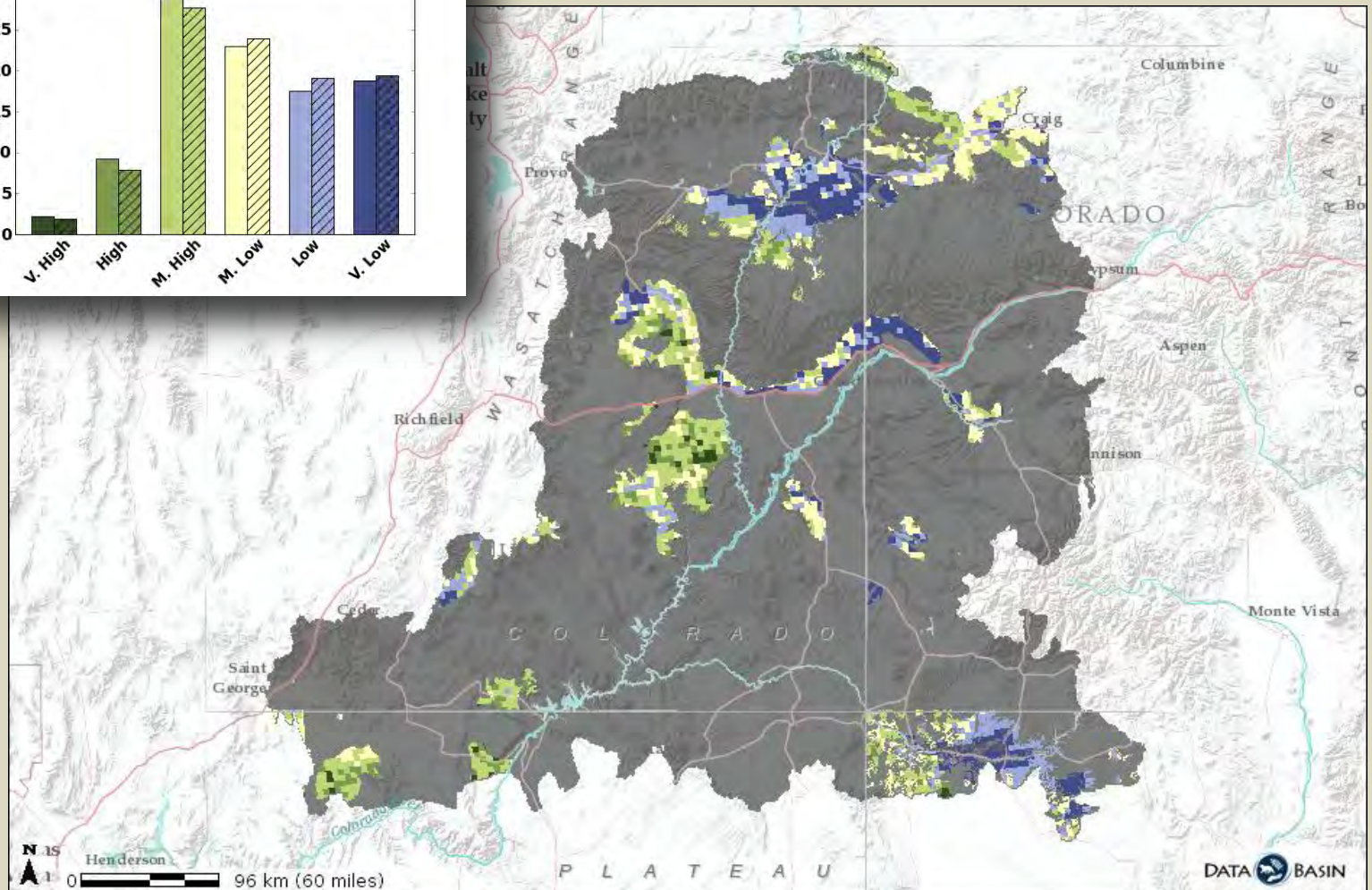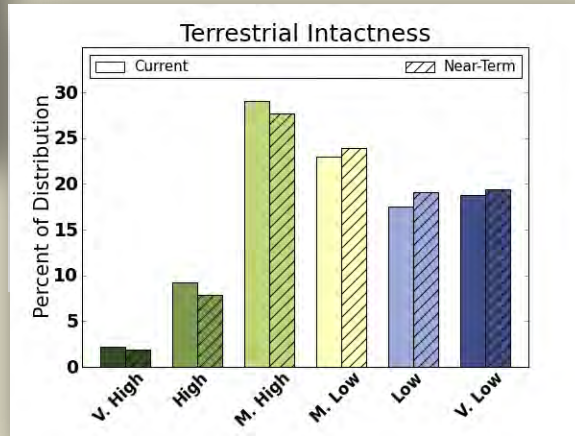# Mountain Lion
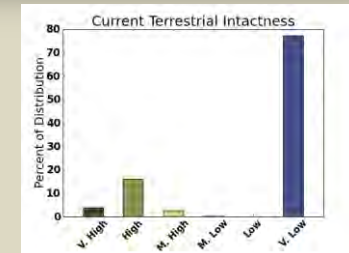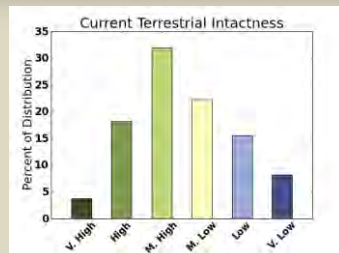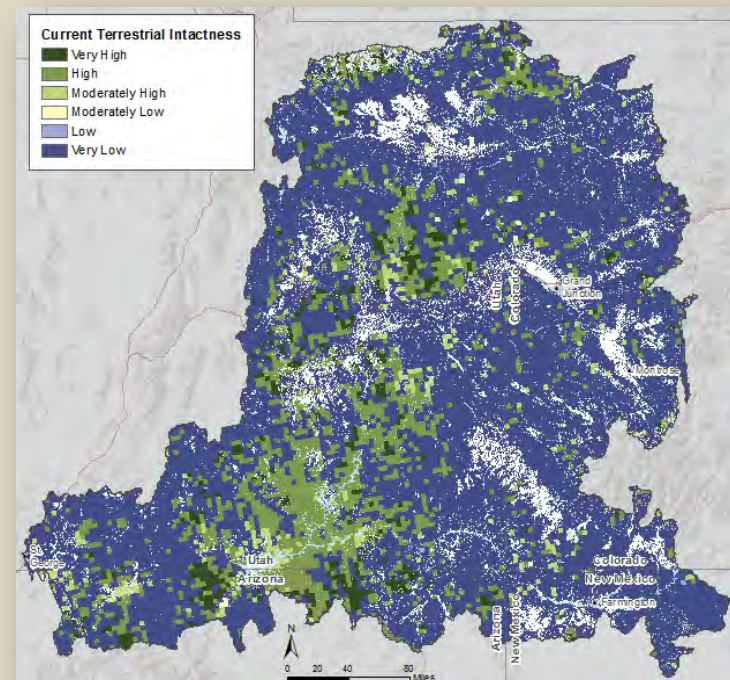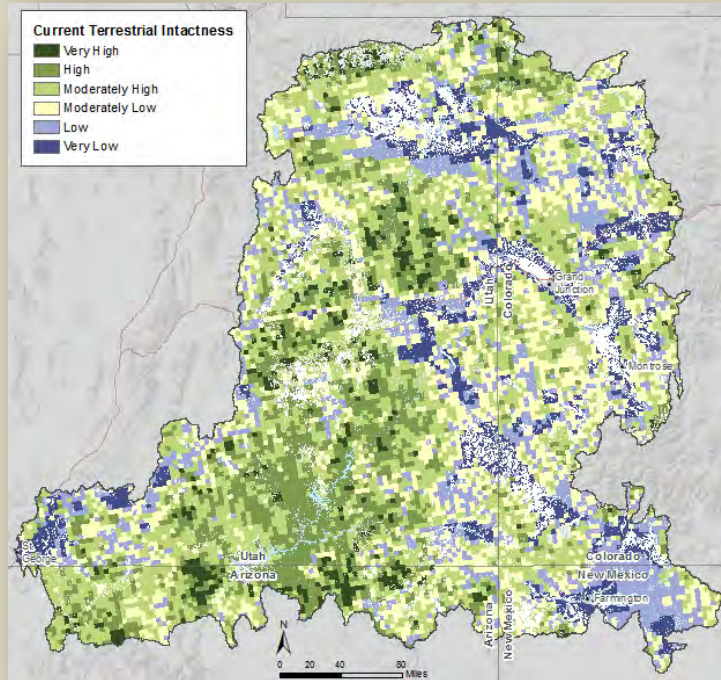
Greater Sage Grouse
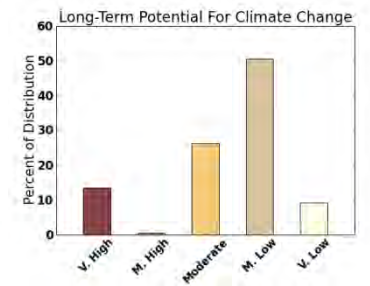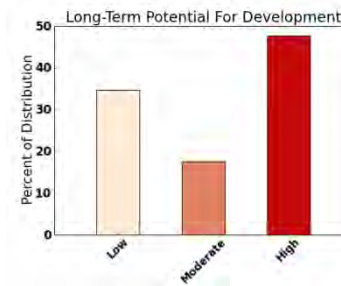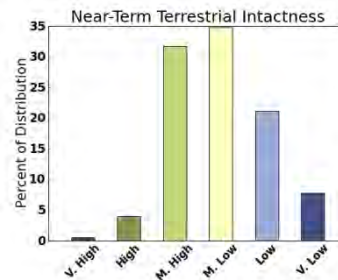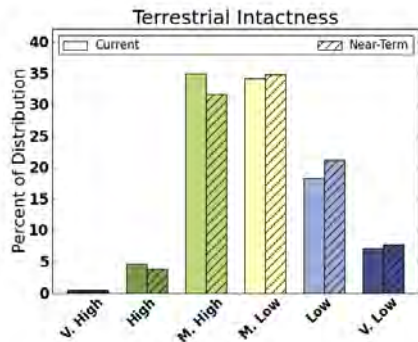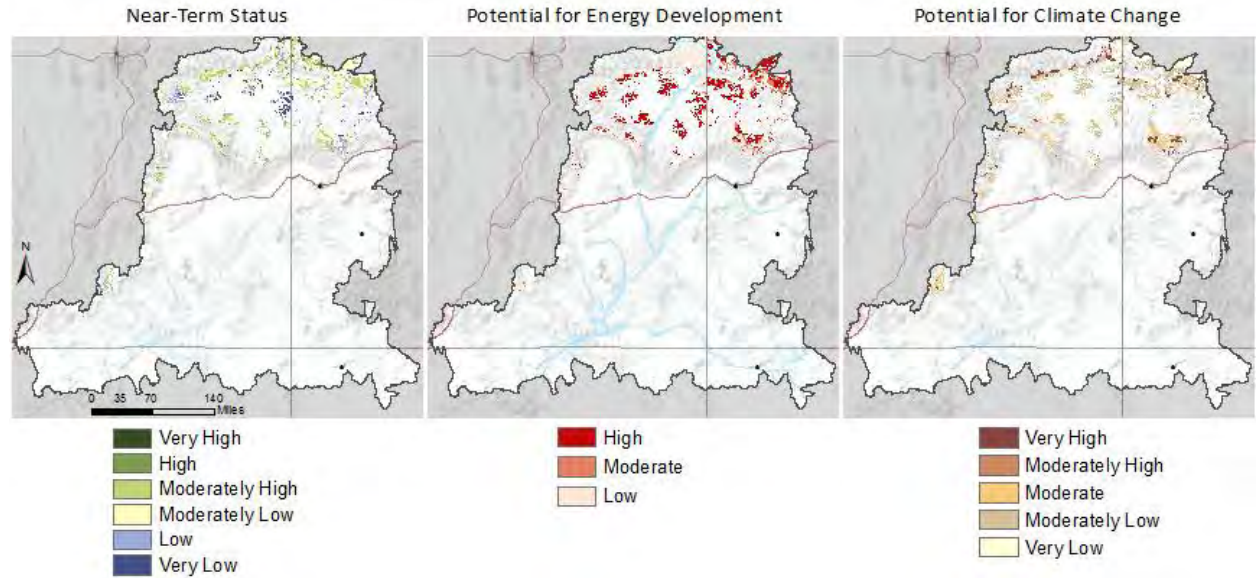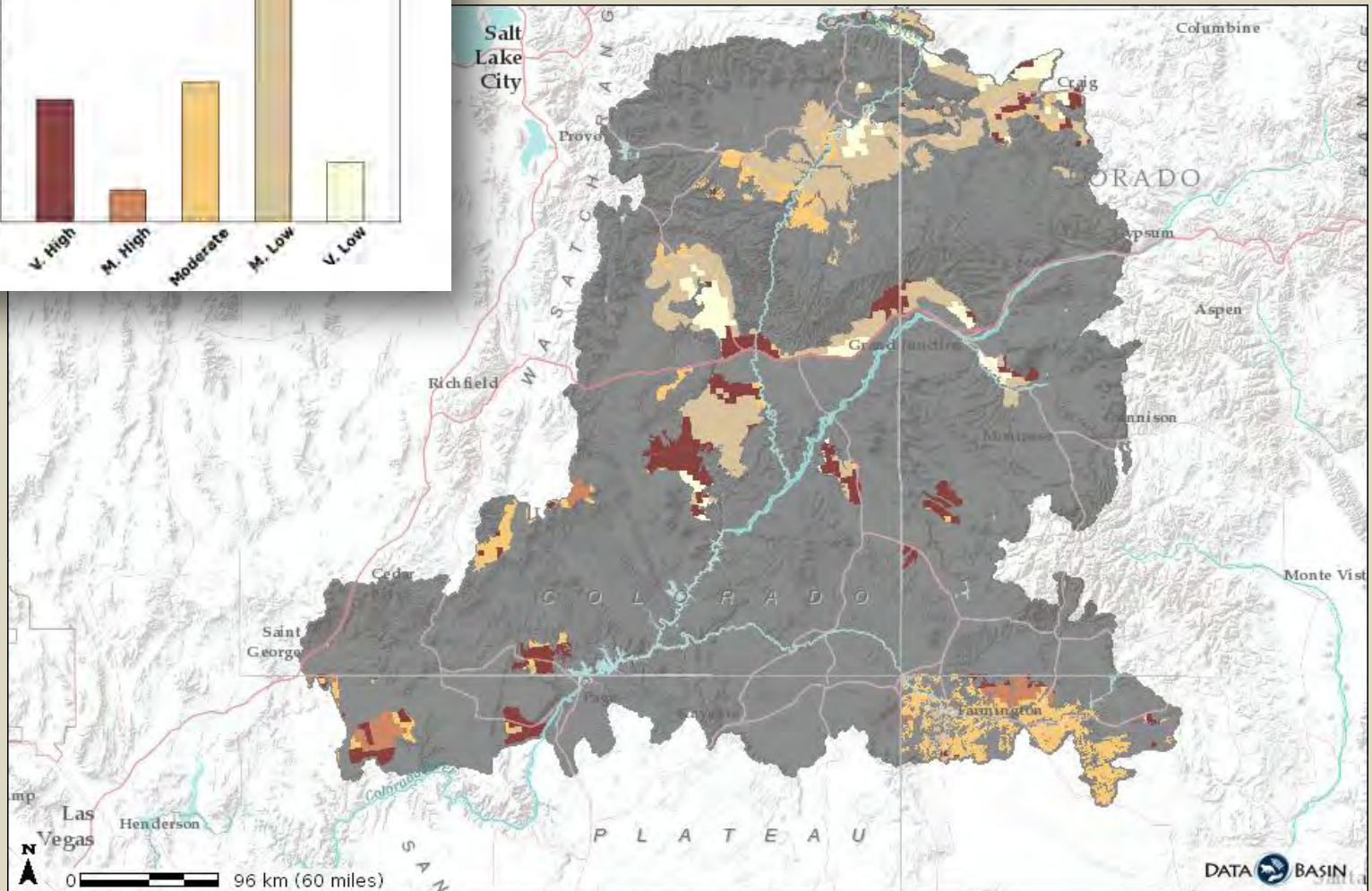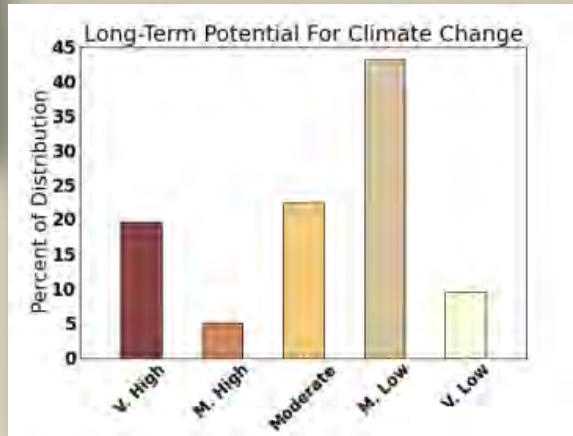
Gunnison Sage Grouse
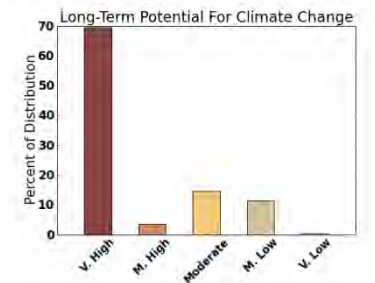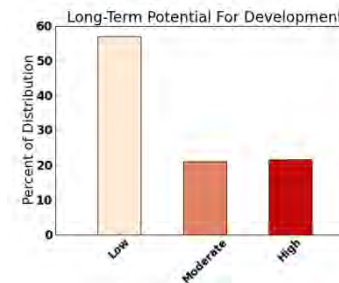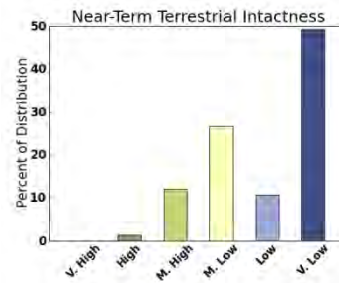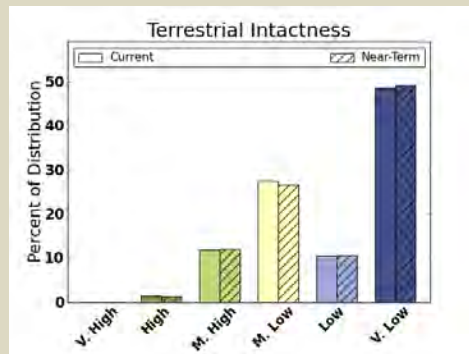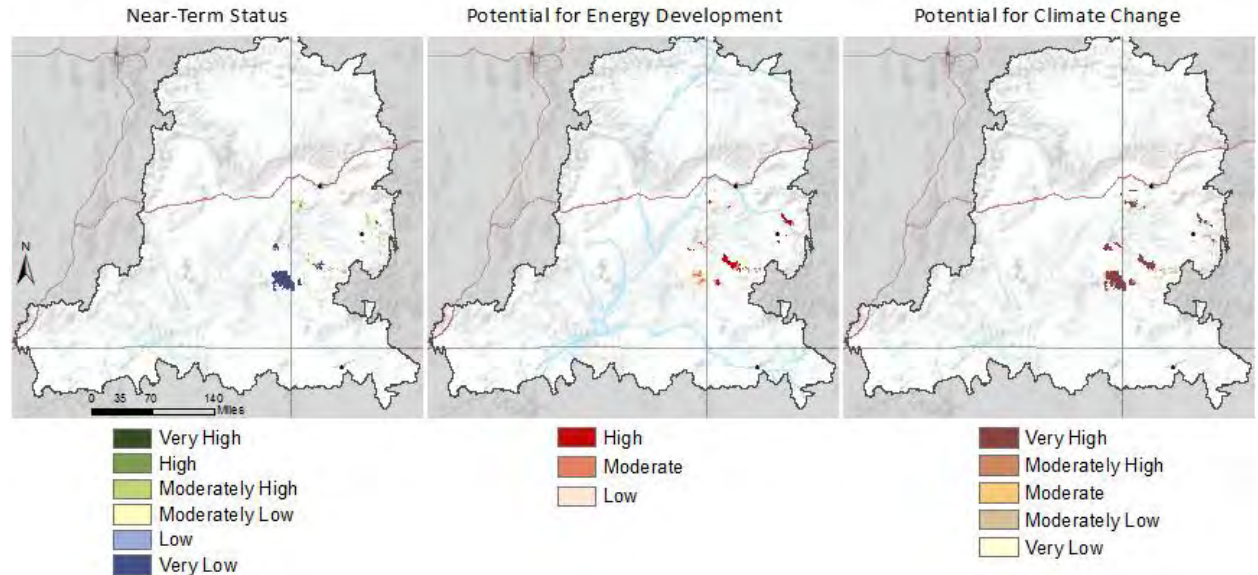
Future Change Agents
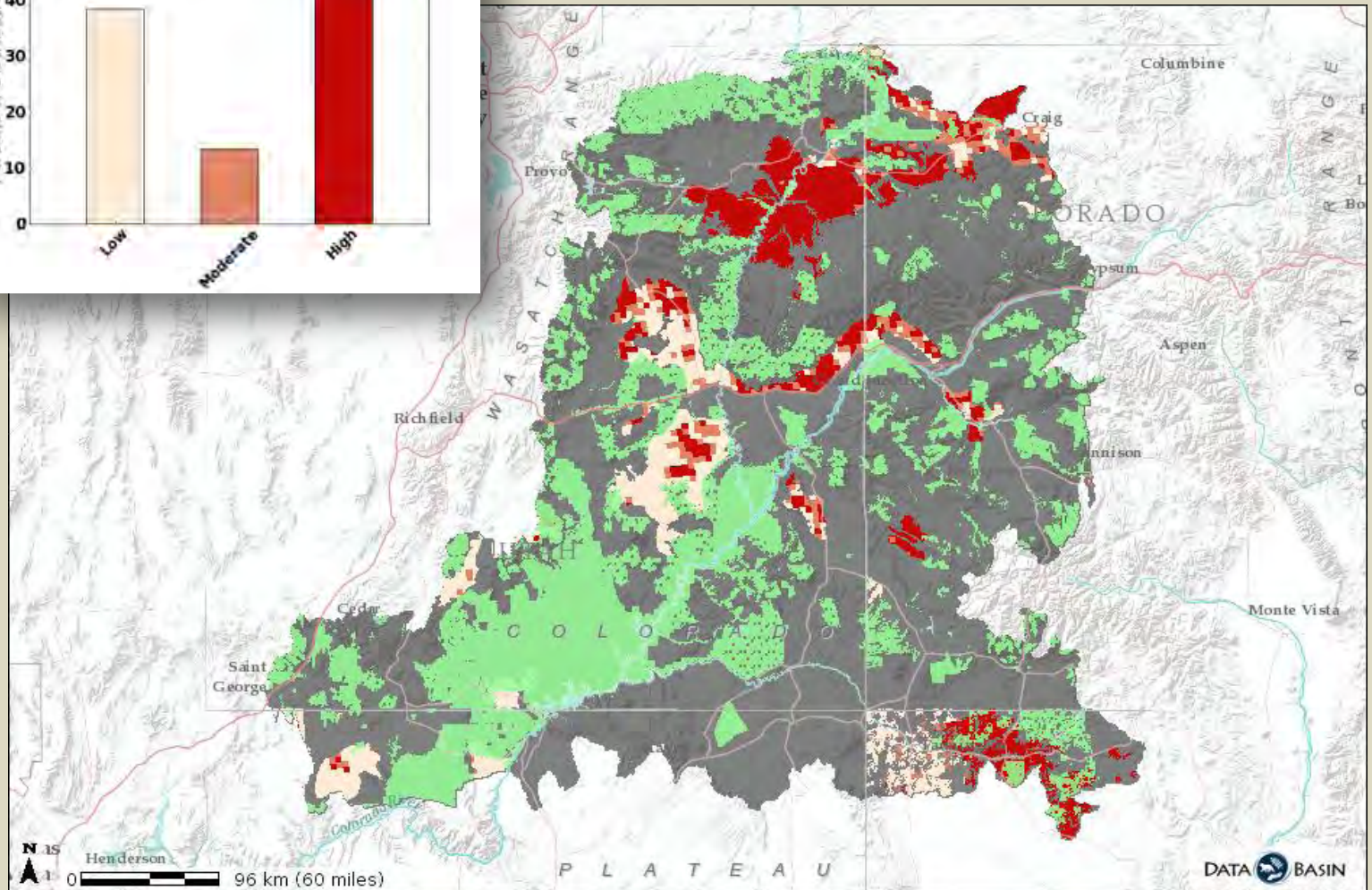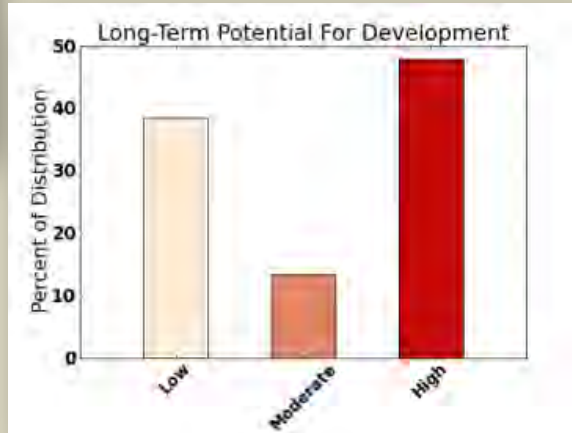## Inter-Mountain Basins Big Sagebrush Shrublands
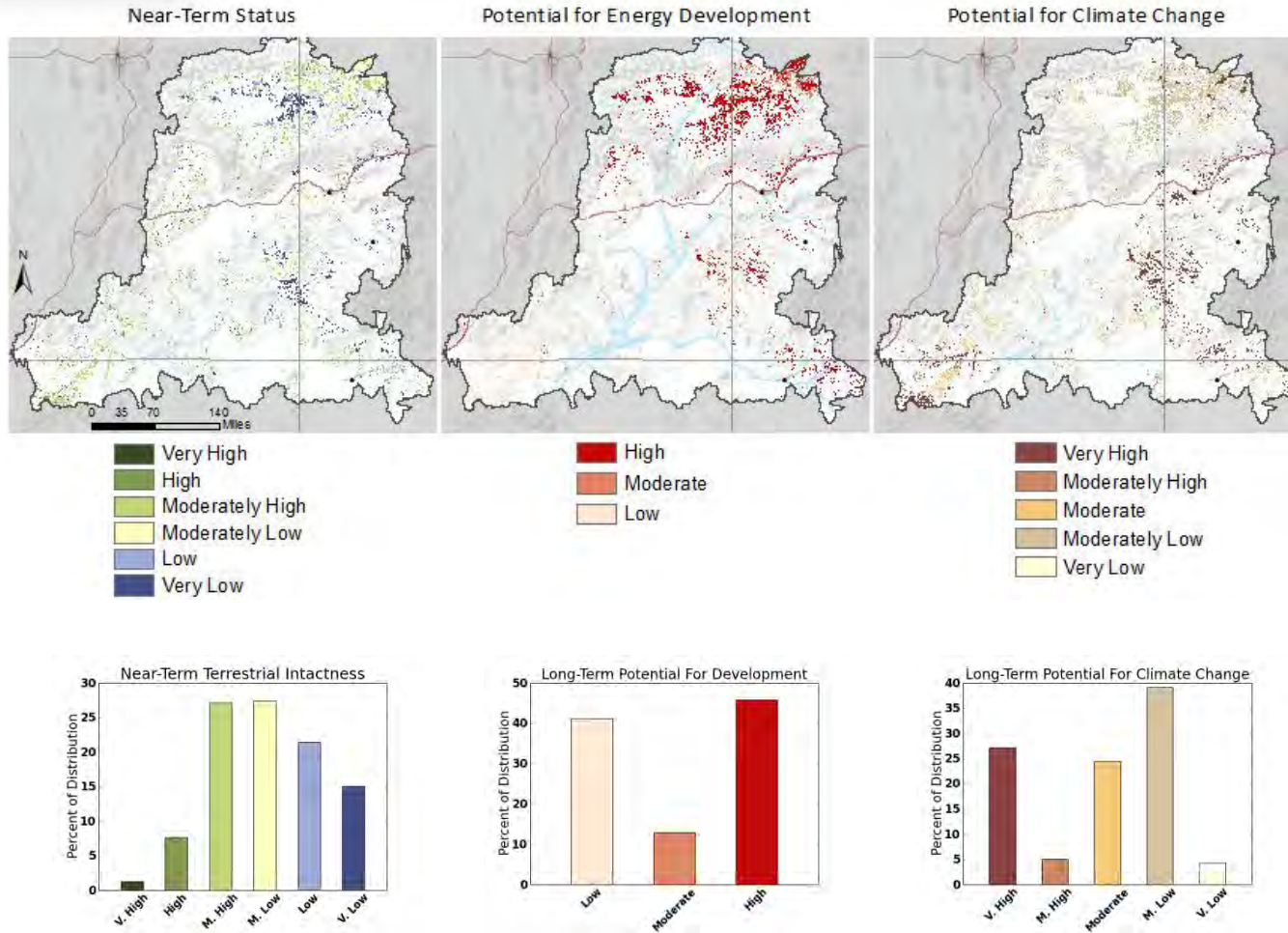
Current and Near-term Status of Pronghorn Antelope

Potential Climate Change Impacts on Pronghorn Antelope

Potential Energy Development Impacts on Pronghorn Antelope

All Results Available in Data Basin

www.databasin.org